The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER BAEUERLE

Appeal No. 2006-1094
Application No. 09/976,788
Technology Center 3600

ON BRIEF

Before OWENS, CRAWFORD and BAHR, *Administrative Patent Judges.*

BAHR, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on appeal from the examiner's rejection of claims 1-30.

We AFFIRM.

BACKGROUND

The appellant's invention relates to a method and control device for operating a torque-converter lockup clutch. In accordance with appellant's invention, the slip of the torque converter is adjusted to a setpoint value while the lockup clutch is being closed, the set point value being continuously selected inside a closing interval as a function of time and taking into account the input torque being applied to the torque converter. A copy of the claims under appeal is set forth in the appendix to the appellant's brief.

The examiner relies upon the following as evidence of unpatentability:

Cowan	5,029,087	Jul. 2, 1991

Claims 1-30 all stand rejected under 35 U.S.C. § 102(b) as being anticipated by Cowan.

Rather than reiterate in their entirety the conflicting viewpoints advanced by the examiner and the appellant regarding this appeal, we make reference to the examiner's answer (mailed June 15, 2005) for the examiner's complete reasoning in support of the rejection and to the appellant's brief (filed March 24, 2005) and reply brief (filed August 18, 2005) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied Cowan patent, and to the respective positions articulated by the appellant and the examiner. After full

consideration of all of the evidence and arguments before us, we conclude that the rejection should be sustained.

The appellant has not presented any separate argument for the patentability of claims 2-30 apart from claim 1. Thus, in accordance with 37 CFR § 41.37(c)(1)(vii), we have selected claim 1 as the representative claim to decide the appeal on this rejection, with claims 2-30 standing or falling with claim 1. *See In re Young*, 927 F.2d 588, 590, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); *In re Wood*, 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978).

Cowan discloses an electronic control system for controlling a torque converter lockup clutch, wherein an electronically controlled valve system is used to modulate the pressure in the control pressure cavity of the lockup clutch to thereby vary the clutch capacity to establish a controlled degree of slip of the clutch so that the actual slip of the clutch may be maintained at a target slip value that is adjusted depending upon the value of input shaft speed data and throttle control position data stored in the memory of a microprocessor. The microprocessor is designed to calibrate a desired slip value *for each engine torque* and turbine speed condition whereby a closed-loop electronic control is achieved to provide a partial converter bypass during a major portion of the vehicle operating time. See abstract.

When the torque converter approaches a hydrokinetic coupling point as the vehicle is operating under a steady state cruising condition, a continuous slip occurs in the converter by reason of the hydrokinetic action of the turbine and the impeller.

The converter thus contributes to smooth torque transfer from the engine to the traction wheels (col. 1, ll. 19-25).

Cowan's controller reduces slip error using a calculation that takes into account the desired slip less a computed actual slip. The slip error is determined to be the difference between a desired slip and the measured slip. The difference in the present error and the error that occurred during a previous background control loop of the controller is determined and that value is used with a corresponding value of the present control loop to get a rate of change in the error. A duty cycle is then computed as a result of that computation so that the bypass clutch control valve, which is sensitive to changes in duty cycle, will produce a controlled decay of slip with respect to time. See col. 3, ll. 5-40. The converter slip is measured using engine RPM and torque converter output shaft speed sensors and that value is subtracted from the desired slip to obtain the slip error (col. 3, ll. 60-63). The desired slip depends on information from the throttle position sensor, an engine speed sensor, a gear shift selector sensor, oil temperature sensor and transition input shaft speed sensor such that the bypass clutch capacity is adjusted to a value that is necessary to achieve the desired slip at any given torque. Torque transients caused by engine operating variables, transmission ratio shifting or throttle movements are then absorbed by momentary periods of increased slip as the bypass clutch solenoid output signal is adjusted during each background control loop of the processor in accordance with the new torque conditions (col. 3, l. 67, to col. 4, l. 11).

Cowan's control system operates as follows: An electronic processor 70 receives input signals from various sensors that measure engine and vehicle operating conditions. The output of the microprocessor is transferred to solenoid 64. The solenoid valve controlled by solenoid 64 is calibrated to receive the control pressure of the solenoid output to establish a pressure that will determine the controlled slip of the clutch (col. 6, ll. 33-48).

One of the input signals to the processor 70 is a throttle position signal received by a position sensor 74. Additionally, an engine speed sensor 76 in the form of a profile and ignition pickup (PIP) delivers an engine speed signal to the processor 70.

It is quite apparent from the above that Cowan's control system adjusts the slip of the torque converter using a setpoint or desired slip, which depends upon information from, *inter alia*, an engine speed sensor (engine RPM) whereby the bypass clutch capacity is adjusted to a value that is necessary to achieve the desired slip "at any given torque" (col. 4, ll. 4-5). Furthermore, the solenoid output signal is adjusted during each background control loop of the processor in accordance with the new torque condition and the desired slip is determined by the actual slip and the final target slip value, causing an exponential decay in the slip as the final target slip is approached. In other words, Cowan's control system adjusts the slip of the torque converter by calculating a desired slip, which is continuously adjusted during each control loop of the processor to cause an exponential decay in the slip

as the target slip is approached (i.e., as a function of time), the desired slip being calculated based in part on the measured engine speed.

The examiner's position in rejecting the claims on appeal is that, while Cowan does not disclose direct measurement of input or engine torque, the engine speed or RPM, which is measured and used as an input in calculating the desired slip, is indicative of torque and the desired slip value is thus selected taking into account the input torque. The examiner also contends that the language "taking into account" is much broader than appellant's arguments imply and does not require that the setpoint be calculated using a measured value of input torque (answer, p. 3).

The appellant argues that Cowan does not disclose, or even suggest, that its system takes into account input torque currently applied to a torque converter in making the error adjustment and points out that Cowan allows rapid torque changes to be absorbed by short periods of increased or decreased slip without being felt by the driver (brief, p. 5). Additionally, the appellant contends that the examiner's broad interpretation of "taking into account" and assertion that engine speed is an indicator of engine output torque and is directly related to engine output torque must be drawing on facts within the personal knowledge of the examiner, since no support was provided for these allegedly conclusory assertions (reply brief, p. 2).

First, we agree with the examiner that the claim language "taking into account" does not require that the setpoint value be calculated using a measured value of input torque. Second, we find that one of ordinary skill in the field of appellant's invention would have been familiar with at least basic concepts of

mechanical engineering and engine design and we take notice of the notoriously well known and basic mechanical engineering concept that every engine has a characteristic speed-torque curve, as illustrated by Marks' Mechanical Engineers' Handbook, Eighth Edition, p. 9-87, Fig. 11 (McGraw-Hill 1978) (copy attached hereto). We thus find that the examiner's position that the engine speed or RPM measured by Cowan and used in calculating the desired slip is indicative of engine torque applied as input to the torque converter is well taken. Further, Cowan's discussion of allowing torque transients, or rapid increases or decreases in torque, merely describes the type of torque transients inherent in a closed-loop control system and is in no way an indication that torque is disregarded in Cowan's system. Finally, on the basis of the above findings, we conclude that Cowan's electronic control system, which calculates desired slip using a signal generated by the measurement of engine speed, selects the setpoint or desired slip value "taking into account the input torque" currently applied to the torque converter.

In light of the above, we shall sustain the rejection of claim 1 as being anticipated by Cowan. We shall also sustain the like rejection of claims 2-30, which stand or fall with representative claim 1, as discussed above.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1-30 is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

TERRY J. OWENS
Administrative Patent Judge

MURRIEL E. CRAWFORD
Administrative Patent Judge

JENNIFER D. BAHR
Administrative Patent Judge

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